



Conductivity Controller LRR  
Visual Display and Operating Unit URB

**LRR 1-52**

**LRR 1-53**

**URB 55**

**EN (USA)**  
English

Original Installation &  
Operating Manual

**850703-00**

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## Content of this Manual

### Product:

- Conductivity controller LRR 1-52
- Conductivity controller LRR 1-53
- Visual display and operating unit URB 55

### First edition:

IOM 850703-00/09-2021cm

### Applicable documents:

You can find the latest Installation & Operating Manuals on our website:  
<http://www.gestra.com>

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## Scope of supply, product package

### LRR 1-5x

- 1 x Conductivity controller LRR 1-52 or LRR 1-53

### URB 55

- 1 x visual display and operating unit URB 55
- 4 x retaining clips
- 1 x power supply connector
- 1 x data cable URB 55

### LRR 1-5x + URB 55

- 1 x Installation & Operating Manual

# How to use this Manual

This Installation & Operating Manual describes the correct use of the LRR 1-52, LRR 1-53 conductivity controller in combination with the URB 55 visual display and operating unit. It applies to persons who integrate this equipment in control systems, install, bring into service, operate, maintain and dispose of this equipment. Anyone carrying out the above-mentioned activities must have read this Installation & Operating Manual and understood its contents.

- Read this Manual in full and follow all instructions.
- Please also read the instructions for use of any accessories.
- The Installation & Operating Manual is part of the product package. Keep it in an easily accessible location.

## Availability of this Installation & Operating Manual

- Make sure this Installation & Operating Manual is always available to the operator.
- If you pass on or sell the equipment to a third party, please also hand over the Installation & Operating Manual.

# Illustrations and symbols used

1. Action to be taken
- 2.

- Lists
  - ◆ Bullet points in lists

## A Keys to illustrations



Additional  
information



Read the relevant  
Installation & Operating Manual

# Hazard symbols in this Manual



**Danger zone, dangerous situation**



**Danger of death from electric shock**

## Types of warning

### **DANGER**

Warning of a dangerous situation that results in death or serious injury.

---

### **WARNING**

Warning of a dangerous situation that may possibly result in death or serious injury.

---

### **CAUTION**

Warning of a situation that may result in minor or moderate injury.

---

### **ATTENTION**

Warning of a situation that results in damage to property or the environment.

---

## Specialist terms, abbreviations

Here, we explain some abbreviations, specialist terms, etc., which are used in this Manual.

### Blowdown controller

A blowdown controller is a conductivity controller with special features for actuating continuous blowdown valves on steam boilers. It can also be used as a conductivity controller in other types of system.

### Continuous blowdown

Continuous and/or periodic removal of a certain (defined) quantity of boiler water via a continuous blowdown valve, e.g., BAE46 or BAE47.

To determine the total dissolved solids in the boiler water, its electrical conductivity is measured in  $\mu\text{S/cm}$ , although some countries also use ppm (parts per million) as the unit of measurement.

Conversion:  $1 \mu\text{S/cm} = 0.5 \text{ ppm}$ .

### Intermittent boiler blowdown

Intermittent blowdown is achieved by the abrupt opening of the intermittent blowdown valve for a period of around 3 seconds.

Time-based pulse/interval actuation of the intermittent blowdown valve optimizes the removal of sludge from the boiler. The interval between the intermittent blowdown pulses can be set between 1 and 200 h (intermittent blowdown interval). The actual duration of intermittent blowdown can be set between 1 and 10 seconds. For large boilers, repeated intermittent blowdown pulses may be required. Repetition can be set between 1 and 10 with an interval from 1 – 10 seconds (pulse interval).

### External intermittent blowdown

If more than one steam boiler is connected to a single blowdown receiver, simultaneous blowdown is not permitted. In this case, an external interlock control can monitor and control the individual blowdown operations.

### Temperature compensation

The conductivity of water changes as the temperature falls or rises. To obtain meaningful readings, it is therefore necessary to base the measurements on the reference temperature of 77 °F (25 °C) and to correct the measured conductivity using the temperature coefficient tC.

### Cell constant

The cell constant is a geometric variable of the conductivity electrode and is taken into account when the conductivity is calculated. However, this constant may change during operation, e.g., due to dirt deposits on the measuring electrode.

If the result of a reference measurement differs from the indicated conductivity reading, first check the temperature compensation.

Modify the cell constant only if the temperature coefficient setting is no longer adequate for correct compensation. Change it until the reading and the indicated conductivity match.



## Specialist terms, abbreviations

### Flushing the continuous blowdown valve

The continuous blowdown valve can be flushed automatically to prevent it from sticking. In this case, the continuous blowdown valve is actuated at intervals (flushing interval) and opened for a certain time (flushing time). After the flushing time, the valve moves to the position set by the control.

### Operating position of the continuous blowdown valve

The operating position of the continuous blowdown valve ensures that the electrode comes into contact with a representative sample of boiler water.

### Standby mode (conductivity control)

To prevent loss of water, continuous blowdown control and automatic intermittent blowdown (if enabled) can be disabled in standby mode or when the burner is switched off. An external control command causes the continuous blowdown valve to move to the CLOSED position. The MIN/MAX limits and monitoring functions remain active in standby mode.

When the equipment is back in normal mode, the continuous blowdown valve returns to the control position. An intermittent blowdown pulse is also triggered (if automatic intermittent blowdown is enabled and a blowdown interval and blowdown time have been set).

### Pb (proportional band)

The proportional band enables the controller amplification to be adapted to suit the controlled system. For further information, see page 9, guide to setting control parameters.

### Ti (reset time)

The integral element ensures that control deviations can be fully corrected, with no remaining deviation. For further information, see page 9, guide to setting control parameters.

### Dead band

If the actual value reaches the (set point  $\pm$  of the dead band), the manipulated variable does not change in this band, see page 9.

### PI controller

Controller with proportional (P) and integral (I) control.

### LRR .. / LRG .. / LRGT .. / URB ..

GESTRA equipment and type designations, see page 9.

### SELV

Safety Extra Low Voltage

# Usage for the intended purpose

LRR 1-52 and LRR 1-53 conductivity controllers can be used in combination with LRG 1x-x conductivity electrodes and LRGT 1x-x conductivity transmitters as conductivity controllers and limiters in steam boilers and hot water installations and in condensate and feedwater tanks. The conductivity controller indicates when MAX or MIN conductivity has been reached, opens or closes a continuous blowdown valve and can actuate an intermittent blowdown valve. LRR 1-52 and LRR 1-53 are classified as operating controls in accordance with UL 60730-1.

## Configuration, operation and visual display

The equipment is configured and operated and information is viewed via the URB 50 or URB 55 visual display and operating unit. The URB 55 is designed for installation in a control cabinet door or switch panel. It may only be used when correctly installed. If you are using a URB 50, please pay attention to the information in Installation & Operating Manual “LRR1-52-LRR1-53-URB50”.

## Overview of possible equipment combinations

Conductivity controller	Conductivity electrode/transmitter	Visual display and operating unit
LRR 1-52	LRG 16-4 LRG 16-9	URB 55
LRR 1-53	LRGT 16-3 / 16-4 LRGT 17-3	

**Fig. 1**

### Key to Fig. 1:

- LRR = conductivity controller  
LRG = conductivity electrode  
LRGT = conductivity transmitter  
URB = visual display and operating unit



To ensure proper use in all applications, please also read the Installation & Operating Manuals for the system components used.

- You can find the latest Installation & Operating Manuals for the system components named in **Fig. 1** on our website:  
<http://www.gestra.com>

## Usage for the intended purpose

### IT security and rules for the use of Ethernet devices

The plant operator is responsible for the security of his/her IT network and must take appropriate action to protect equipment, systems and components from unauthorized access.

#### **Pay attention to the following instructions when using Ethernet devices in your plant:**

- Do not connect equipment, systems or components to an open network, such as the Internet, without safeguards in place.
- To fully protect a PLC runtime system on a control system that is available on the Internet, the use of common security mechanisms (firewall, VPN access) is absolutely essential.
- Restrict access to all components to authorized persons only.
- Change default passwords before bringing into service for the first time!
- Deploy defense in depth mechanisms in your plant security, to restrict access and control to individual products and networks.

### Applicable standards for the LRR 1-52, LRR 1-53

The LRR 1-52, LRR 1-53 conductivity controller has been tested and approved for use in the scope governed by the following directives and standards:

#### **Standards:**

- UL 60730-1 and CAN/CSA E60730-1  
General Requirements for Automatic Electrical Controls

## Usage for the intended purpose

### Applicable standards for the URB 55

The URB 55 has been tested and approved for use in the scope in the scope governed by the following directives and standards:

#### Standards:

- UL 61010-1 and CAN/CSA C22.2 No. 61010-1  
Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use - Part 1: General Requirements
- UL 61010-2-201 and CAN/CSA C22.2 No. 61010-2-201  
Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 2-201: Particular Requirements for Control Equipment

## Improper use



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**There is a danger of death due to explosion if the equipment is used in potentially explosive atmospheres.**

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Do not use the equipment in potentially explosive atmospheres.

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---

**Do not bring any equipment into service that does not have its own specific rating plate.**

---

The rating plate indicates the technical features of the equipment.

---

## Basic safety information



**There is a risk of electric shock during work on electrical systems.**

- Always switch off the voltage to the equipment before performing work on the terminal strips.
- Check that the plant is not carrying live voltage before commencing work.



**Faulty equipment is a danger to plant safety.**

- If the LRR 1-52, LRR 1-53 conductivity controller does not behave as expected, it may be faulty.
- Perform failure analysis.
- Only replace faulty equipment with identical equipment from GESTRA AG.

## Required personnel qualifications

Activity	Personnel	
Integration in control system	Specialist staff	Plant designer
Installation/electrical connection/ bringing into service	Specialist staff	Electrician/installer
Operation	Boiler service technician	Staff trained by the plant operator
Maintenance work	Specialist staff	Electrician
Setup work	Specialist staff	Plant construction

**Fig. 2**

## Notes on product liability

The manufacturer cannot accept any liability for damages resulting from improper use of the equipment.

# Function

The LRR 1-52, LRR 1-53 conductivity controller is a 3-position stepping controller. It evaluates the signals from a conductivity electrode (e.g., LRG 16-4, LRG 16-9) or conductivity transmitter (LRGT 16-3, LRGT 16-4, LRGT 17-3).

The conductivity controller indicates when MAX or MIN conductivity has been reached, opens or closes a continuous blowdown valve and can actuate an intermittent blowdown valve.

Function tests and failure diagnosis can be performed using the URB 55 visual display and operating unit.

## What happens if MIN/MAX conductivity is reached

If the minimum or maximum conductivity is reached, the appropriate output contact is opened.

## What happens if the MAX limit is exceeded

- If used as a conductivity limiter, the LRR 1-52, LRR 1-53 conductivity controller does not interlock automatically when the MAX limit is exceeded.

## Possible combinations of functions and equipment

Combining the LRR 1-52, LRR 1-53 conductivity controller with the conductivity electrodes, conductivity transmitters and URB 55 visual display and operating unit enables the following common functions to be performed:

Conductivity controller	LRR 1-52	LRR 1-53
Conductivity measurement with an LRG 1-... conductivity electrode and separate Pt 100 resistance thermometer <b>or</b> Conductivity measurement with an LRG 16-9 conductivity electrode with integrated resistance thermometer.	●	
Evaluation of the temperature-compensated current signal of a connected LRGT 1x-x conductivity transmitter.		●
3-position stepping controller with proportional-plus-integral control action (PI controller) and actuation of an electrically operated continuous blowdown valve.	●	●
MAX alarm when conductivity rises above the maximum limit.	●	●
MIN alarm when conductivity drops below the minimum limit. Alternatively, MIN relay for automatic intermittent blowdown.	●	●
If a potentiometer is connected (in the continuous blowdown valve), the valve position can be displayed. The valve position is then shown on the URB 55 visual display and operating unit	●	●
Switch-selectable (DIP3) actual value/manipulated variable output, e.g., for separate indication of the actual value or direct connection to a continuous blowdown valve (manipulated variable output)	●	●
Volt-free input 24 V DC (standby) for inputting an external command Control OFF / Valve CLOSED / Intermittent blowdown OFF	●	●

**Fig. 3**

## Function

Visual display and operating unit	URB 55
Indication of actual value X (bar chart in $\mu\text{S}/\text{cm}$ or ppm)	●
Indication of valve position Yw (bar chart in %)	●
Setting the measuring range	●
Indication/setting of control parameters	●
Trend log	●
Indication and listing of errors, alarms and warnings	●
Test of MIN/MAX output relays or actuation of intermittent blowdown valve	●
Manual/automatic mode	●
Password protection	●
Level and conductivity controllers can be operated simultaneously	●

**Fig. 4**

## Technical data for the LRR 1-52, LRR 1-53

### Supply voltage

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- 24 V DC +/-20%; PELV / CLASS2

### Power consumption

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- Max. 5 W

### Current input

---

- Max. 0.3 A

### Reset hysteresis

---

- MAX limit: - 3% of set MAX limit (factory default)
- MIN limit: + 3% of set MIN limit (factory default)

### Fuse

---

- M0.5A (medium time-lag)

### Input/output

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- Interface for data exchange with the URB 55 visual display and operating unit

### Inputs

---

- 1 x analog input for potentiometer 0 - 1000  $\Omega$ , two-wire connection (indication of valve position)
- 1 x volt-free input 24 V DC (standby) for inputting an external command  
Control OFF / Valve CLOSED / Intermittent blowdown OFF

### Outputs

---

- **Continuous blowdown valve (CLOSED/OPEN) \***
  - ◆ 2 x volt-free relay contacts (changeover relays) \*\*
  - ◆ Maximum switching current - 8 A at 250 V AC / 30 V DC -  $\cos \varphi = 1$  \*\*
- **MIN/MAX alarm \***
  - ◆ 2 x volt-free relay contacts (changeover relays) \*\*
  - ◆ Maximum switching current - 8 A at 250 V AC / 30 V DC -  $\cos \varphi = 1$  \*\*
- or
- **MAX alarm and MIN relay as intermittent blowdown valve \***
  - ◆ 1 x volt-free relay contact (changeover relay) - intermittent blowdown valve \*\*
  - ◆ 1 x volt-free relay contact (changeover relay) - MAX alarm \*\*

\* Inductive loads must have interference suppression (RC combination) as specified by the manufacturer.

\*\* Contact material AgNi0.15, AgSn02

### Analog output

---

- 1 x actual value output 4 - 20 mA, e.g., for indicating the actual value
- Max. load resistance 500  $\Omega$
- Inductive loads must have interference suppression (RC combination) as specified by the manufacturer



## Technical data for the LRR 1-52, LRR 1-53

### Indicators and controls

---

- 1 x multicolor LED (amber, green, red)
  - ◆ amber = power up
  - ◆ green = running
  - ◆ red = malfunction
- 1 x 4-pole code switch for configuring the conductivity controller.

### Protection

---

- Terminal box: IP40 according to EN 60529
- Terminal strips: IP20 according to EN 60529
- As a UL open type, the equipment must be installed in a control cabinet.

### Electrical safety

---

- Pollution degree 2, overvoltage category II according to UL 60730-1

### Admissible ambient conditions

---

- Service temperature: 14 ° - 122 °F (-10 ° - 50 °C) [at power-on 32 ° - 122 °F (0 ° - 50 °C)]
- Storage temperature: -4 ° - 158 °F (-20 ° - 70 °C) \*
- Transport temperature: -4 ° - 176 °F (-20 ° - 80 °C) (< 100 hours) \*
- Air humidity: Max. 95%, non-condensing
  - \* Only switch on after a defrosting period of 24 hours

### Terminal box

---

- Terminal box material: Lower section of black polycarbonate (glass-fiber reinforced), front of gray polycarbonate
- 2 x 15-pole terminal strips, removable separately
- Max. wire size per screw terminal:
  - ◆ 1 x AWG12 (4.0 mm<sup>2</sup>) solid, or
  - ◆ 1 x AWG14 (2.5 mm<sup>2</sup>) stranded with sleeve, or
  - ◆ 2 x AWG16 (1.5 mm<sup>2</sup>) stranded with sleeve
- Terminal box attachment: Mounting clip on support rail TH 35 (according to EN 60715)

### Weight

---

- Approx. 1.1 lb (0.5 kg)

### Other information

---

- Incorporated type 1 action operating control
- Pollution degree 2, impulse voltage DC supply = 500 V, AC output = 2500 V

## Technical data for the URB 55

### Supply voltage

---

- 24 V DC (---) +/- 20%; PELV / CLASS2

### Power consumption

---

- Max. 14.4 W

### Current input

---

- Max. 0.6 A (at 24 V)

### Fuse

---

- Internal, automatic

### Interfaces for data transmission

---

- 2 x Ethernet 10/100 Mbit switched (Modbus TCP/IP)
- 1 x USB host port (versions 2.0 and 1.1)
- 1 x slot for SD card

### Indicators and controls

---

- Capacitive 5" touchscreen with LED backlight
- Resolution 800 x 480 pixels (WVGA)
- Brightness 200 Cd/m<sup>2</sup>, dimmable
- Size (field of view) 110 mm x 65 mm

### Protection

---

- Front: IP66 according to EN 60529
- Back: IP20 according to EN 60529

### Admissible ambient conditions

---

- Service temperature: 32 ° - 140 °F (0 ° - 60 °C)
- Storage temperature: -4 ° - 158 °F (-20 ° - 70 °C)
- Transport temperature: -4 ° - 158 °F (-20 ° - 70 °C)
- Air humidity: 5% – 85% relative humidity, non-condensing

### Enclosure

---

- Material: Front (metal/glass) / back (metal enclosure for electronics)
- Enclosure attachment with the supplied fastening elements
- Intended for installation in a control cabinet or switch panel

### For dimensions, see page 18

---

- Front panel (W x H) 5.79 in (147 mm) x 4.21 in (107 mm)
- Switch panel cutout (W x H) 5.35 in (136 mm) x 3.78 in (96 mm)
- Mounting depth 2.05 in (52 mm) + 0.32 in (8 mm) protruding

## Technical data for the URB 55

### Weight

---

- Approx. 2.21 lb (1 kg)

### Internal battery, permanently installed, non-replaceable

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- Type: Lithium-ion, charged automatically



If the equipment is out of service for six months or more, we recommend connecting it to the supply voltage for one day, to recharge the battery.

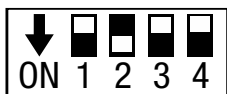
## Factory settings of the LRR 1-52, LRR 1-53

The conductivity controller is delivered with the following factory default settings:

- Code switch setting: (sliding switch, white)

### LRR 1-52

- For configuration, see page 20 / **Fig. 19**

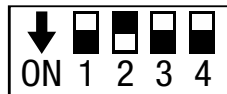


S 1 = OFF  
S 2 = ON  
S 3 = OFF  
S 4 = OFF

- Measuring range:  
0.25 to 5000 ppm (0.5 to 10000  $\mu\text{S}/\text{cm}$ )
- Correction factor C LRG: 1 cm-1
- Temperature compensation: off
- Temperature coefficient: 2.1% /  $^{\circ}\text{C}$

### LRR 1-53

- For configuration, see page 20 / **Fig. 19**



S 1 = OFF  
S 2 = ON  
S 3 = OFF\*)  
S 4 = OFF

- Measuring range: 0.25 to 3000 ppm  
(0.5 to 6000  $\mu\text{S}/\text{cm}$ )

\*) Controller software version 311178.13 or later

### LRR 1-52, LRR 1-53

- MAX switchpoint: 3000 ppm (6000  $\mu\text{S}/\text{cm}$ )
- MIN switchpoint: 250 ppm (500  $\mu\text{S}/\text{cm}$ )
- Reset hysteresis: MAX limit - 3% of set limit  
(factory default)
- Set point: 1500 ppm (3000  $\mu\text{S}/\text{cm}$ )
- Proportional band (Pb):  $\pm 20\%$  of set point
- Reset time (Ti): 0 seconds
- Dead band:  $\pm 5\%$  of set point
- Valve runtime: 360 seconds
- Control mode: Automatic
- MIN relay function: MIN alarm
- 24h flushing: On
- Flushing interval: 0 hours
- Flushing time: 180 seconds. The set time takes effect twice. The valve moves to OPEN for 180 seconds and to CLOSED for 180 seconds.

#### With actuation of an intermittent blowdown valve (MIN relay function = automatic intermittent blowdown)

- Intermittent blowdown interval: 24 hours
- Intermittent blowdown time: 3 seconds
- Number of intermittent blowdown pulses: 1
- Pulse interval: 2 seconds

## Factory default settings of the URB 55

The visual display and operating unit is delivered with the following factory default settings:

- PWL 1: 111
- Conductivity in:  $\mu\text{S/cm}$
- VNC Service: ON
- Target IP: 192.168.0.84
- Subnet: 255.255.255.0
- Gateway: 192.168.0.1
- Modbus TCP: Off

## Rating plate, identification of the LRR 1-52, LRR 1-53

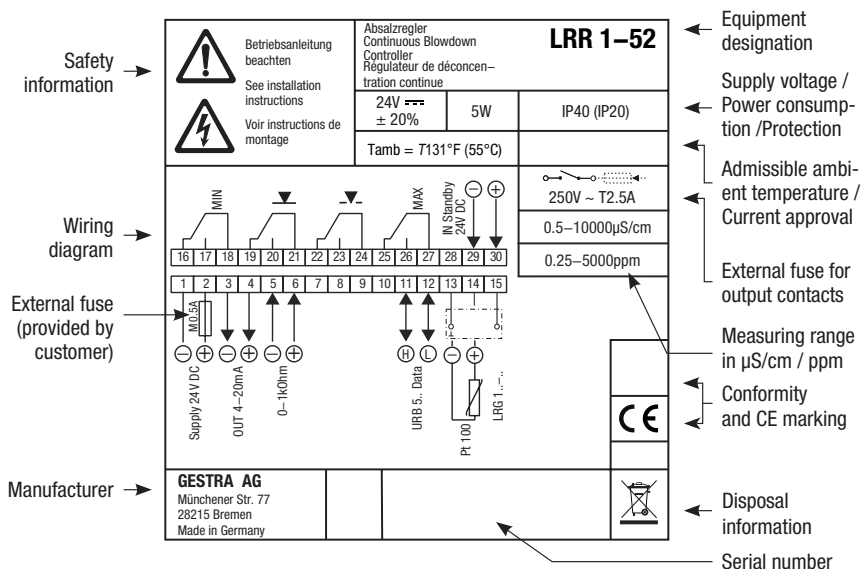


Fig. 5



The date of production is printed on the side of the equipment.

	Input rating: 24VDC, 5W
	Output rating : Pilot duty B300 / R300
	Ambient temperature: 32–131°F (0–55°C)
	Wiring: Use Copper Conductors Only, Use 60/75°C Conductors, Use No.18–16 AWG Wire Size Only, Tightening: Torque 0.79Nm or 7lb in.
	Use with accessory: LRG 16–4, LRG 16–9, URB 55

	Input rating: 24VDC, 5W
	Output rating : Pilot duty B300 / R300
	Ambient temperature: 32–131°F (0–55°C)
	Wiring: Use Copper Conductors Only, Use 60/75°C Conductors, Use No.18–16 AWG Wire Size Only, Tightening: Torque 0.79Nm or 7lb in.
	Use with accessory: LRG16-3, LRG16-4, LRG17-3

Fig. 6 LRR 1-52

LRR 1-53

# Rating plate, identification of the URB 55

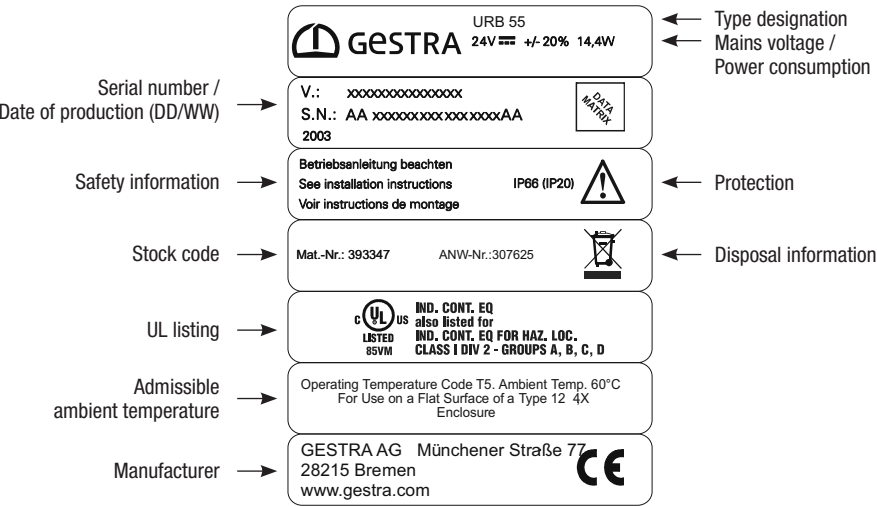


Fig. 7

## Functional elements and dimensions of the LRR 1-52, LRR 1-53

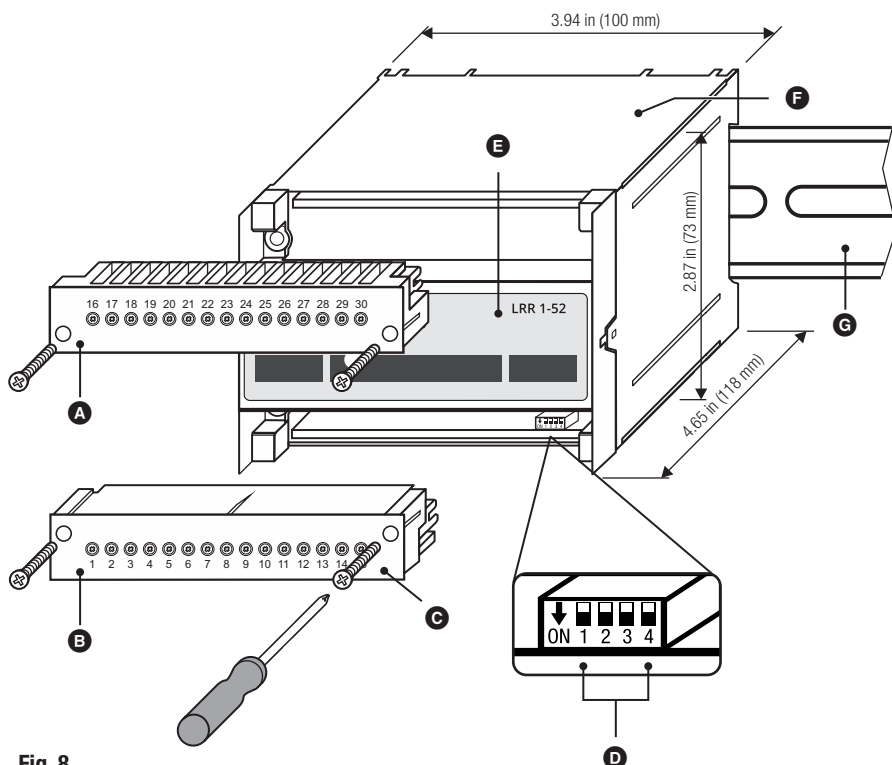


Fig. 8

- A** Upper terminal strip
- B** Lower terminal strip
- C** Fastening screws (M3)
- D** 4-pole code switch for configuring the conductivity controller
- E** Front membrane with status LED, see page 24
- F** Terminal box
- G** Support rail TH 35



The code switch can be accessed by disconnecting and removing the lower terminal strip.

Equipment settings, see page 24.



## Installing the LRR 1-52, LRR 1-53 conductivity controller

The LRR 1-52, LRR 1-53 conductivity controller snaps onto a TH 35 support rail in a control cabinet.

### **DANGER**

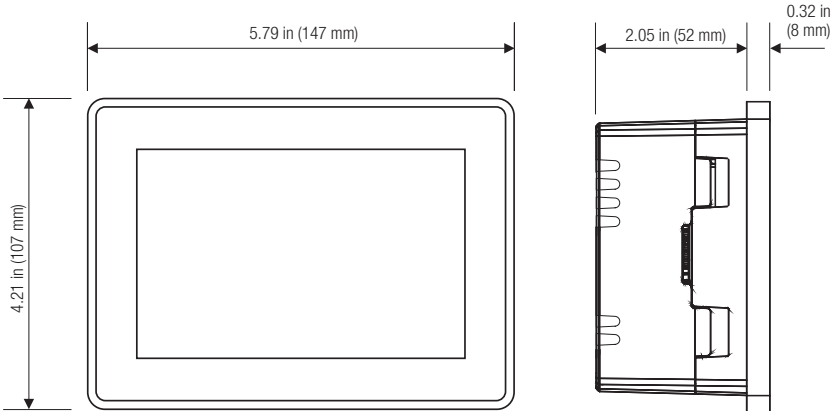


**There is a risk of electric shock during work on electrical systems.**

- Switch off the voltage to the plant before you install the equipment.
- Check that the plant is not carrying live voltage before commencing work.

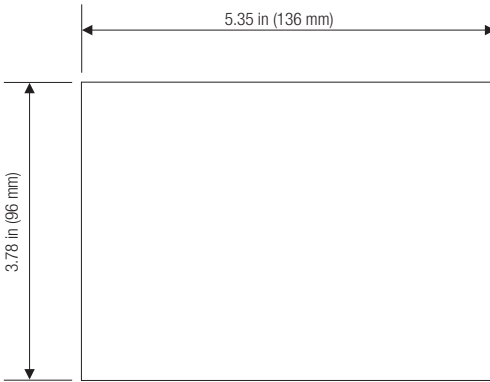
1. Switch off the voltage to the plant and secure any surrounding equipment in the control cabinet that is live, so it cannot be touched.
2. Carefully press the unit onto the support rail until the holder clips into place.

## Dimensions of the URB 55



**Fig. 9**

## Required installation aperture in the control cabinet door or switch panel



**Fig. 10**

## Installing the URB 55

The URB 55 is designed for installation in control cabinet doors or switch panels. The maximum panel thickness is 0.39 in (10 mm).

### For this, you will need the following tools:

- A tool for cutting the installation aperture
- A Phillips PH2 screwdriver

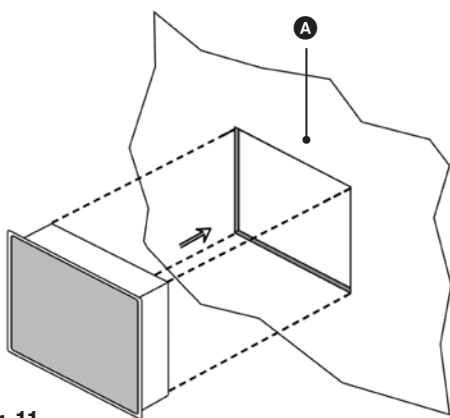


Fig. 11

- A** Installation aperture 5.35 in (136 mm) x 3.78 in (96 mm), e.g., in a control cabinet door

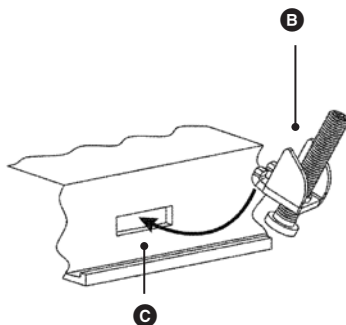


Fig. 12

- B** 4 x fastening elements (supplied)
- C** 4 x mounting holes in the unit

1. Cut an aperture (see **Fig. 11**) in the control cabinet door or switch panel.
2. Stick the supplied gasket to the back of the display frame.
3. Carefully push the URB 55 visual display and operating unit through the aperture, making sure the gasket is correctly seated.
4. Insert the supplied fastening elements and tighten until the corners of the display frame are in contact with the gasket.
5. Remove the protective film from the display.

## Connecting the URB 55

### Ports and sockets on the back of the unit

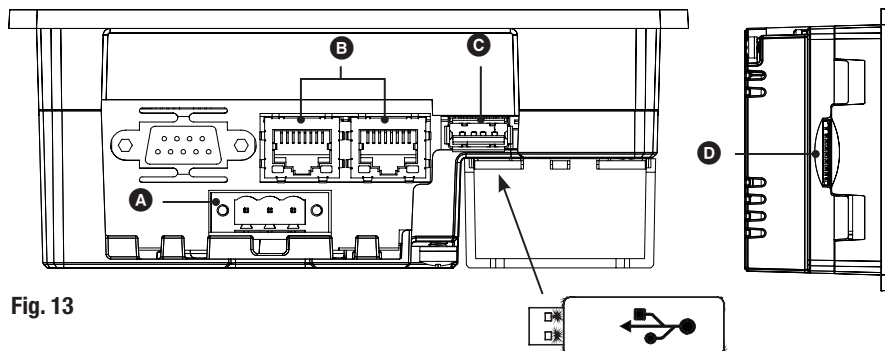


Fig. 13

- A** 1 x 3-pole connector for 24 V DC supply voltage
- B** 2 x Ethernet ports 10/100 Mbit switched (Modbus TCP/IP)
- C** 1 x USB host port (versions 2.0 and 1.1) for USB sticks with FAT32/FAT or exFAT file format
- D** 1 x slot for SD card with FAT32 file format (for service purposes) \*

\* SDHC memory cards are not supported.

### Connection for 24 V DC supply voltage - pin assignment

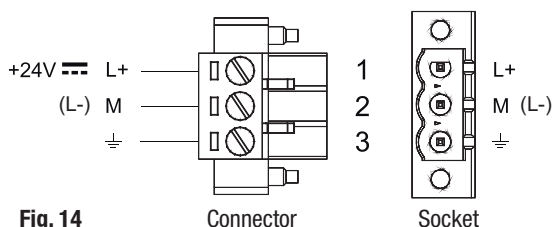
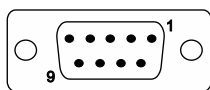


Fig. 14



Use a SELV (Safety Extra Low Voltage) power supply unit for connecting the supply voltage. To connect the supply voltage to the supplied 3-pole connector, use a cable with a max. wire size of AWG14 (2.5 mm<sup>2</sup>).

### Pin assignment of data line between URB 55 and LRR 1-52, LRR 1-53



Pin 2 = Data\_L >> LRR 1-52, LRR 1-53 = terminal 12

Pin 7 = Data\_H >> LRR 1-52, LRR 1-53 = terminal 11

Fig. 15

## Safety information on the electrical connection

### **DANGER**



**Incorrectly connecting the conductivity controller or any associated components is a danger to plant safety.**

- Connect the conductivity controller and all associated components as shown in wiring diagrams **Fig. 16** to **Fig. 18** in this Manual.
- Do not use unused terminals as jumpers or support terminals.

# Wiring diagram for the LRR 1-52 conductivity controller

## Connecting LRG 16-4 conductivity electrodes

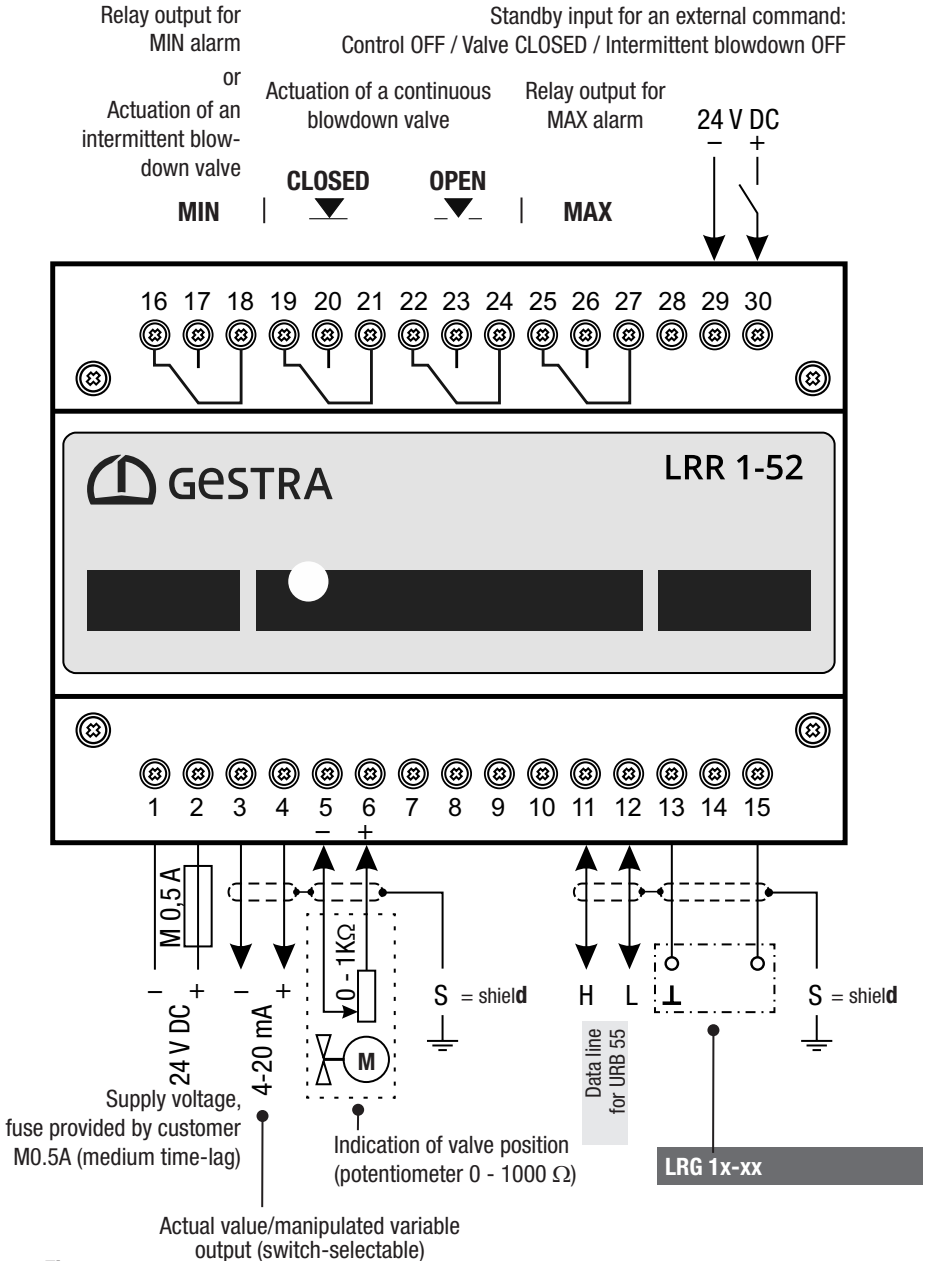
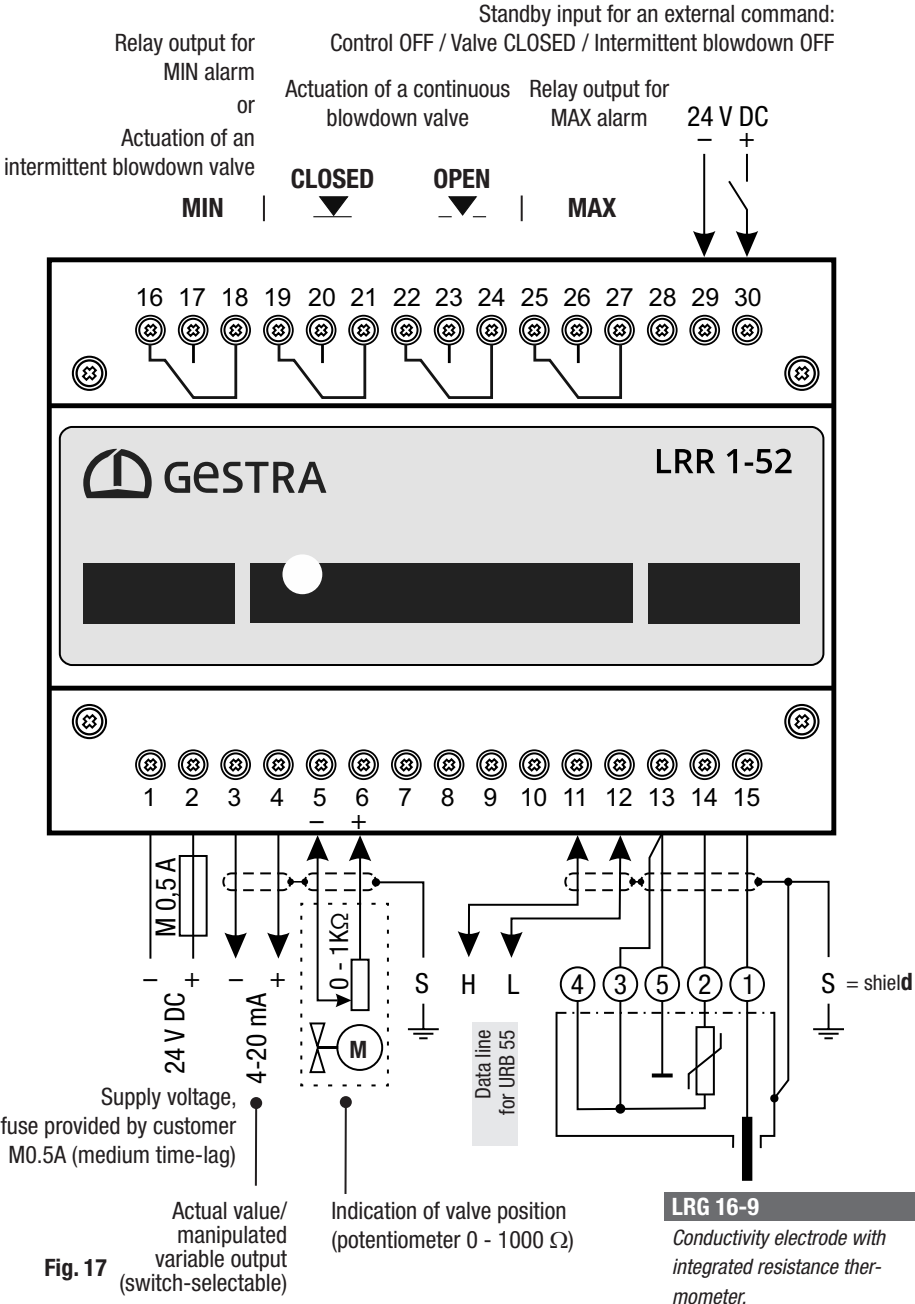


Fig. 16

# Wiring diagram for the LRR 1-52 conductivity controller

## Connecting an LRG 16-9 conductivity electrode



# Wiring diagram for the LRR 1-53 conductivity controller

## Connecting an LRGT 1x-x conductivity transmitter (4 - 20 mA)

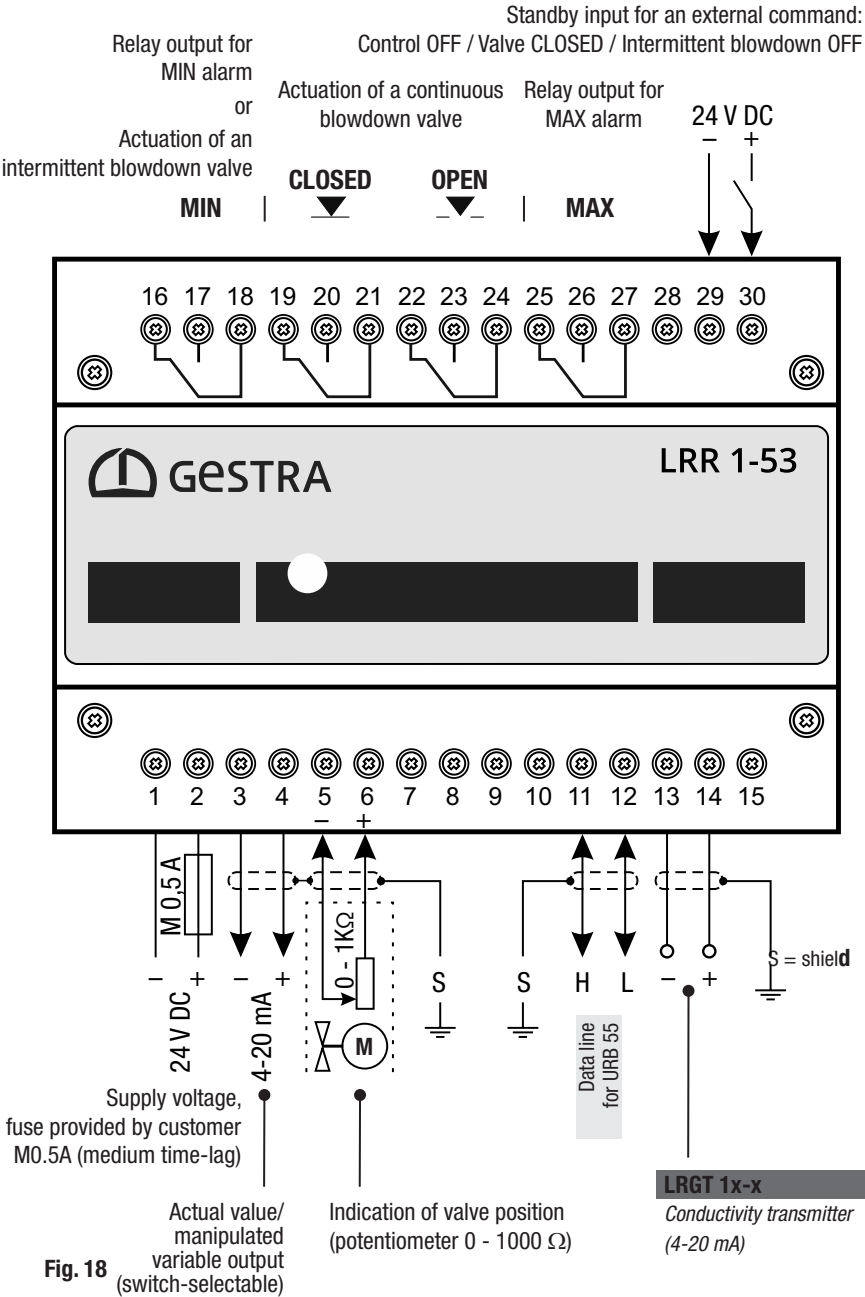


Fig. 18



## Electrical connection of the LRR 1-52, LRR 1-53

### Connecting the 24 V DC power supply

- The LRR 1-52 or LRR 1-53 conductivity controller is supplied with 24 V DC.
- A safety power supply unit that delivers a Protective Extra Low Voltage (PELV / CLASS2) must be used to supply the equipment with 24 V DC.
- Use a 0.5A medium time-lag fuse as an external fuse.

### Connecting the MIN/MAX/CLOSED/OPEN output contacts

- Connect the outputs as shown in wiring diagrams **Fig. 16** to **Fig. 18**.
- Only use the terminals specified in the wiring diagrams.
- Use an external 2.5A slow-blow fuse to protect the switching contacts.
- If used as a conductivity limiter, the LRR 1-52, LRR 1-53 conductivity controller does not interlock automatically when the MAX limit is exceeded.
- If the installation requires an interlock, this must be implemented in the downstream (safety) circuit.

### Notes on connecting inductive loads

All connected inductive loads, such as contactors and actuators, must have interference suppression using RC combinations, as specified by the manufacturer.

### Connecting an LRG 16-4 conductivity electrode

- Use a shielded, multi-core TC-ER control cable with minimum wire size AWG18, e.g., OELFLEX CONTROL TM CY 3G1.
- Connect the conductivity electrode as shown in wiring diagrams **Fig. 16** to **Fig. 17**.
- Route connecting cables separately from power cables.

### Connecting an LRG 16-9 conductivity electrode

- The LRG 16-9 conductivity electrode is equipped with an M12 A-coded, 5-pole sensor connector. A pre-wired control cable (with connector and socket) is available in various lengths as an accessory for connecting the equipment.
- To connect the LRR 1-52 conductivity controller, please remove the connector and wire the terminal strip as shown in wiring diagrams **Fig. 16** to **Fig. 17**.
- **If you are not using the pre-wired control cable:**  
Use a shielded, multi-core TC-ER control cable with minimum wire size AWG18, e.g., OELFLEX CONTROL TM CY 5G1.  
In addition, connect a socket, e.g., Binder series 713 99-0436-58-05, to the control cable at the conductivity electrode end.
- Route connecting cables separately from power cables.

## Electrical connection of the LRR 1-52, LRR 1-53

### Connecting an LRGT 1x-x conductivity transmitter

- Use a shielded, multi-core TC-ER control cable with minimum wire size AWG18, e.g., OELFLEX CONTROL TM CY 5G1.
- Connect the conductivity transmitter as shown in the wiring diagram **Fig. 18**.
- Maximum cable length = 328 ft (100 m).
- Route connecting cables separately from power cables.



The conductivity transmitter must be connected to its own dedicated supply voltage.

### Connecting the actual value/manipulated variable output (4 - 20 mA)

- Please note the load resistance of max. 500  $\Omega$ .
- Use a shielded, multi-core TC-ER control cable with minimum wire size AWG18, e.g., OELFLEX CONTROL TM CY 3G1.
- Maximum cable length = 328 ft (100 m).
- Route connecting cables separately from power cables.

### Connecting the standby input (24 V DC)

- 24 V DC input, for external command Control OFF, Valve CLOSED, Intermittent blowdown OFF.
- Maximum cable length = 98 ft (30 m).

### Connecting the potentiometer (0 - 1000 $\Omega$ )

- Use a shielded, multi-core TC-ER control cable with minimum wire size AWG18, e.g., OELFLEX CONTROL TM CY 3G1.
- Maximum cable length = 328 ft (100 m).
- Route connecting cables separately from power cables.

## Connecting the data line between the conductivity controller and the URB 55

A pre-wired control cable with socket is supplied for connecting the equipment. For terminal assignment, see wiring diagrams **Fig. 16** to **Fig. 18**.

- If you are not using the pre-wired control cable, you must use a shielded, twisted-pair control cable with minimum wire size AWG23 (0.25 mm<sup>2</sup>), e.g., LIYCY 2 x AWG23 (0.25 mm<sup>2</sup>).
- Maximum cable length 98 ft (30 m).
- Wire the terminal strip as shown in wiring diagrams **Fig. 16** to **Fig. 18**.
- Wire the 9-pole D-Sub connector as shown in **Fig. 15**.
- Connect the grounding point of the enclosure (URB 55) to the central grounding point in the control cabinet. Connect the shield just once to the central grounding point in the control cabinet.
- Route connecting cables separately from power cables.

## Connecting the SPECTORmodul bus system

Using the supplied data cable [16 ft (5 m)], connect the URB 55 to the first controller in the system. If the system has a second controller, position this immediately next to the first controller and connect terminals 11 and 12 of the two controllers to one another as follows:

- Terminal 11 (controller 1) to terminal 11 of controller 2
- Terminal 12 (controller 1) to terminal 12 of controller 2

## Changing the equipment settings

### **DANGER**



**Danger of death from electric shock! Do not touch live connections on terminal strips.**

- Always switch off the voltage to the equipment before performing work on the terminal strips.
- Check that the plant is not carrying live voltage before commencing work.

You can change the input and function of the LRR 1-52, LRR 1-53 conductivity controller at any time if necessary using code switch  (see **Fig. 19**).




Make changes before installing the conductivity controller, when access is easier.

#### **You will need the following tools:**

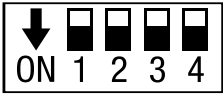
- Flat blade screwdriver, size 3/32 in (2.4 mm)
- Pozidriv screwdriver, size PZ1

#### **Proceed as follows:**

1. Switch off the supply voltage to the equipment or plant.
2. Unscrew and pull off the lower terminal strip, see **Fig. 8**.
3. Set code switch  (see **Fig. 19**) as desired.
4. When your changes are complete, put the terminal strip back on and screw in place.

# Changing the equipment settings

Code switch ① - sliding switch, white



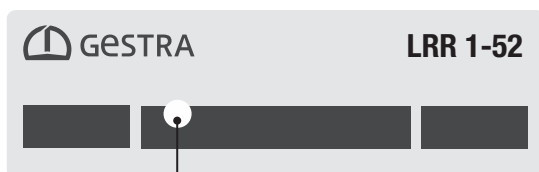
## Conductivity controller LRR 1-52, LRR 1-53

Code switch ①				
S1	S2 *	S3 *	S4	Configuration
OFF				MIN relay output as MIN alarm (factory setting)
ON				MIN relay output for actuating an intermittent blowdown valve
	OFF			Node ID = 72 *
	ON			Node ID = 69 - compatibility with older equipment (factory setting)
		OFF		Terminal 3/4 (Out 2) as actual value output (X) (factory setting) *
		ON		Terminal 3/4 (Out 2) as manipulated variable output (Yw)
			OFF	Electrical conductivity measured in $\mu\text{S/cm}$ (factory setting)
			ON	Electrical conductivity measured in ppm

\* Controller software version 311178.13 or later

Fig. 19

## Status display of the LRR 1-52, LRR 1-53



**Fig. 20**

Multicolor LED (amber/green/red),  
amber = power up / green = in operation / red = malfunction

## Visual display and operating unit URB 55

### Switching on the supply voltage

Please switch on the supply voltage for the LRR 1-5x conductivity controller and the URB 55 visual display and operating unit.

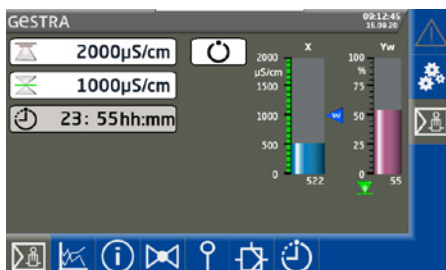
- For the controller(s), the LED first lights up amber, then green.
- The home screen of the URB 55 visual display and operating unit appears.
- If two controllers are connected to the visual display and operating unit, both controllers will be shown, see example.



If you tap one of the controller overview screens, a full screen for that controller will open on the display, see screenshot below.



- If just one controller is connected, the home screen of this controller will be shown (example).

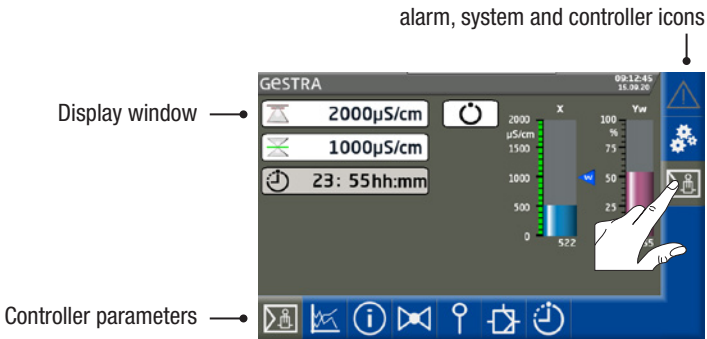


# Operation and navigation

The URB 55 is operated in situ using the color touchscreen or via Ethernet using remote software.

## User interface (example)

The URB 55 visual display and operating unit shows parameters, operating states, etc. on a display. The user interface of the URB 55 is divided into three areas:



- The display window shows operating states and actual values.
- The various parameter screens are opened via the icons. These icons change dynamically and are either shown or hidden, depending on the current page and configuration.
- All entries and actions, e.g., opening setup menus and parameter screens, are initiated by tapping the buttons and input fields. The active screen has a gray background, see above.
- You can close smaller windows that appear by touching the screen outside of the window.

## Color coding of input and status fields

Background color	Description, function
Gray	Unavailable/static
White	Input field
Green	Status information, On, OK status
Red	Status information, Alarm status

Fig. 21



# Operation and navigation

## Automatic functions



If you do not input anything on the display for 10 minutes, the brightness is automatically dimmed and you will be logged off.

- If you do not input anything on the display for one hour, the program automatically returns to the home screen.
- If communication to the controller is disrupted, the message “Offline” appears in the general display area.



## Entering parameters using the virtual keypad

Tapping an input field opens a numeric virtual keypad.

The keypad shows the old value (Old) and the limits (Min/Max).



Your entries must remain within these limits.

### Function keys:

Delete last digit.

Confirm entry.

Discard entries and close keypad.

Old		Min		Max	
03		1		12	
<div>03</div>				03	
7	8	9	Esc		
4	5	6	←		
1	2	3	↩		
.	0	-	↪		

## Operation and navigation

### Entering parameters with password protection

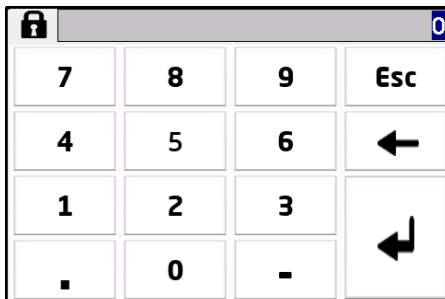
Password protection prevents parameters and settings from being changed by unauthorized persons. The password prompt appears automatically when you tap an input field.



If you do not input anything for 10 minutes, you will be logged off again.

#### Default password:


- Password = 111



### Recommendation for initial setup

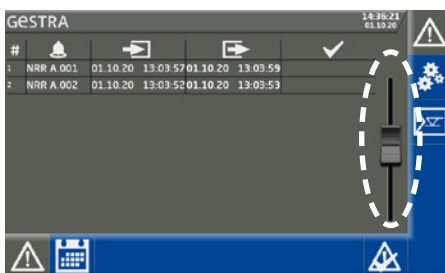
Log on using the default password, then safeguard your system by creating your own password.

### Disabling parameter entry after successful login

-  Parameter entry can be disabled by tapping the struck-through padlock icon at the bottom right. The icon appears after you have logged in successfully.
























### Scroll bar for long lists and menus

























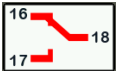




You can use the scroll bar to navigate up and down long lists and menus in order to select the desired parameters.





















Scroll bar

## Icons and functions of the LRR 1-52, LRR 1-53

Icon	Description	Icon	Description
	Alarm		Pump (mode) Only pump or valve mode is possible!
	Setup/settings		Valve (mode) Only pump or valve mode is possible!
	Home screen		Controller parameters
	Level controller		3E controller parameters
	Conductivity controller		Open valve
			Close valve
	Logged in with password/ Log off		Alarm history
	Info		Reset alarm
	Time		Alarm number
	Password		Alarm coming
	Network		Alarm going
	Modbus TCP overview (optional)		Reset alarm

Icon	Description	Icon	Description
	New password		Valve/electrode raw value
	Confirm new password		Dead band
	Discard entry/Cancel		Water (flowrate)
	Apply entry/Confirm entry		Steam (flowrate)
	Switch on		Fill control
	Switch off		Drain control
	Datalog/Trend		Pump OFF threshold
	Electrode calibration		Pump ON threshold
	Set point		Stop pump in manual mode
	Manual (mode)		Start pump in manual mode
	Max alarm switchpoint Off/On		Automatic
	Min alarm switchpoint Off/On		
	Max switchpoint		Relay test
	Min switchpoint		
	Max switchpoint	<b>Pb</b>	Proportional band
	Min switchpoint	<b>Ti</b>	Reset time
	Set point	<b>Tt</b>	Valve runtime

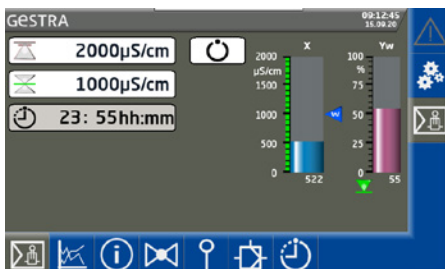
Icon	Description	Icon	Description
	24h flushing		Continuous/intermittent blowdown interval
	Flushing time		Setting 0 to 100% / valve/electrode raw value
	Damping		Correction factor
	Temperature compensation On/Off		Temperature coefficient
	Measuring range setup		Automatic intermittent blowdown
	Intermittent blowdown pulses		Intermittent blowdown time
	Intermittent blowdown active		Pulse interval
	24h flushing active		Controller on standby
	Continuous blowdown valve in operating position		Controller in manual mode

**Fig. 22**

## Home screen of LRR 1-52, LRR 1-53 conductivity controllers

The home screen provides an overview of the controller status and parameters. Bar charts display current readings and change color depending on their status. This enables you to rapidly assess the plant status.

Icons on the bar charts indicate the status of the connected electrode.



### Opening the parameter screens:

Use the following buttons to open the controller parameter screens:



**Switchpoints,**  
see page 46



**Trend,**  
see page 46



**Test / Controller information,**  
see page 46



**Valve control,**  
see page 46



**Calibration of conductivity electrode,** see page 46



**Set controller parameters,**  
see page 46



**Set automatic intermittent blowdown,** see page 46



Further icons appear below the bar charts, depending on the configuration. These are explained in the sections below.

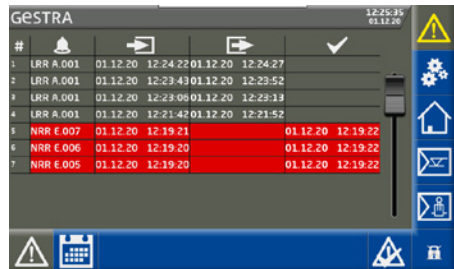


- A** Standby (mode)
- B** Intermittent blowdown (active)
- C** 24h flushing
- D** Manual (mode)

# Alarm and fault indications

## Status and color of warning triangle:

- **Yellow, flashing**  
Active alarms are present that have not been reset.
- **Yellow, on continuously**  
Active reset alarms are present.
- **Gray**  
No alarms are active.



#						
1	LRR A.001	01.12.20	12:24:22	01.12.20	12:24:27	
2	LRR A.001	01.12.20	12:23:43	01.12.20	12:23:52	
3	LRR A.001	01.12.20	12:23:08	01.12.20	12:23:13	
4	LRR A.001	01.12.20	12:21:42	01.12.20	12:21:52	
5	NRR E.007	01.12.20	12:19:21		01.12.20 12:19:22	
6	NRR E.006	01.12.20	12:19:20		01.12.20 12:19:22	
7	NRR E.005	01.12.20	12:19:20		01.12.20 12:19:22	

## Opening the alarm and error list



Open the list of active alarms.

## Description of the alarm and error list

Alarms and fault indications are entered in the columns (Coming, Going, Reset) with a time stamp. The most recent alarm is always shown at the top of the list.



Description of error codes for controller, see page 47.

## Description of display:



The alarms are stored in the list with a code:

A = alarm / E = error



### Coming

Time at which the event occurred.



### Going

Time when the event ended.



### Reset

Date and time the event was reset.

## Options:



Reset alarms and errors. Finished “alarms” are deleted after they have been reset.



Open the alarm history, see page 47.

# Alarm and fault indications

## Opening the alarm history

All alarms are stored in the alarm history. The memory can hold 300 alarms.



Alarms are stored cyclically and are restored after a power failure.



Open the alarm history.

#						
1	LRR A.001	01.12.20	12:24:22	01.12.20	12:24:27	
2	LRR A.001	01.12.20	12:23:43	01.12.20	12:23:52	
3	LRR A.001	01.12.20	12:23:06	01.12.20	12:23:13	
4	LRR A.001	01.12.20	12:21:42	01.12.20	12:21:52	
5	NRR E.007	01.12.20	12:19:21		01.12.20	12:19:22
6	NRR E.006	01.12.20	12:19:20		01.12.20	12:19:22
7	NRR E.005	01.12.20	12:19:20		01.12.20	12:19:22

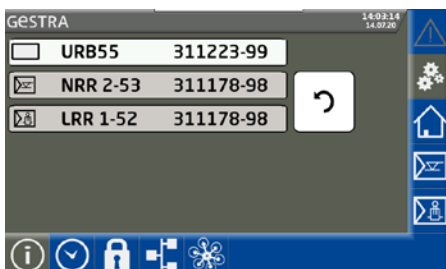


## System settings

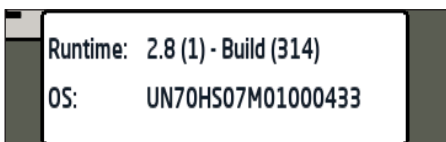


Tapping the icon opens the menu containing the list of all connected controllers.

The current equipment firmware is also shown.



**URB 55** Tap the line containing the URB 55 for > 2 s to see the runtime and OS of the URB 55.



**Opening further menus:**



**System information**



**Setting the date/time**



**Password**



**Network settings**



**Open Modbus TCP list (optional)**

## System information



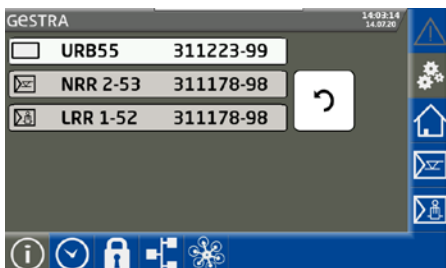
Open the “*System Information*” menu and select the desired action.

### Description of display:

The connected controller(s) are shown with their software version.



Press the button to update a system or view installed (new) equipment.



## Setting the date/time



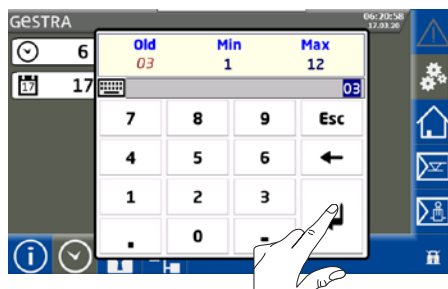
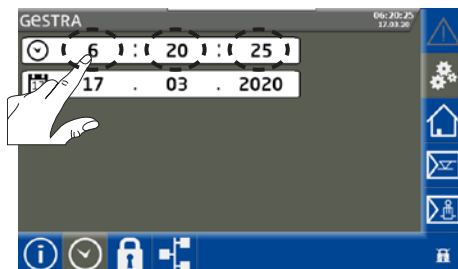
Open the “Date/Time” menu and enter the desired settings.

### Description of display/settings:

#### ■ Time / Date

Tap the appropriate field and set the date and time.

Confirm these changes to apply them.



## Password

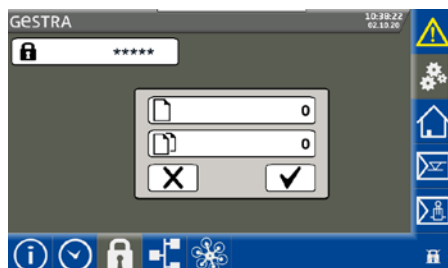


Open the “Password” menu.

**Factory default setting:** 111

### Changing your password:

1. Tap the input field.
2. Enter the new password in the top line and confirm it by entering it again in the second line.



## Network settings



Open the “*Network settings*” menu.

Set the network to suit your local requirements and, at the end, confirm your settings.

### Description of display:

#### ■ Use DHCP:

- ◆ **No:** Static IP address
- ◆ **Yes:** The IP address is obtained via DHCP

#### ■ IP Address

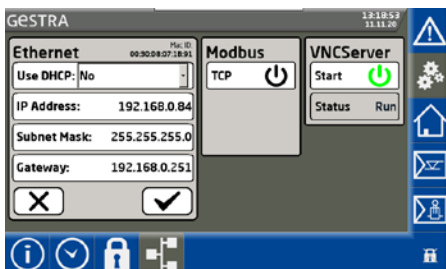
The IP address of the URB 55.

#### ■ Subnet mask

The current subnet mask.

#### ■ Gateway

The IP address of the gateway.



## Data exchange via Modbus TCP

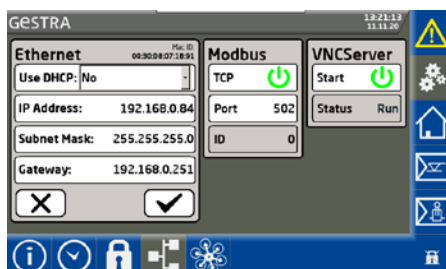
The URB 55 visual display and operating unit has a Modbus TCP server. This enables all values to be forwarded to a higher-level control system or control center.



For Modbus communication, switch on the connection using the TCP On button.

### Parameter:

- Modbus ID: 0
- Port: 502
- Modicon Modbus: 1-based



## Data exchange via Modbus TCP



If Modbus communication has been switched on, you can open the dynamic datapoint list.

- The raw data from the register is shown on this screen. There is a scroll bar at the side for scrolling through the data.
- You can find the latest datapoint list on our website at:  
<http://www.gestra.com/documents/brochures.html>

The screenshot shows the GESTRA software interface with a table of register data. The table has 6 columns: Address, Value, Address, Value, Address, Value. The data is as follows:

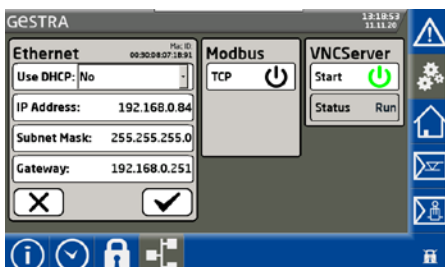
30000	1	30010	162	30100	2	30110	2
30001	62	30011	0	30101	0	30111	0
30002	50	30012	0	30102	0	30112	0
30003	20	30013	0	30103	20	30113	0
30004	85	30014	10	30104	2500	30114	12
30005	3	30015	2	30105	3	30115	5

The interface also includes a status bar at the bottom with icons for information, navigation, security, and a gear icon for settings. A vertical scroll bar is visible on the right side of the table.

## VNC server / Remote software

The URB 55 can be operated remotely from a PC using VNC remote software, e.g., UltraVNC Viewer. This allows a 1:1 display of the URB 55 on the computer.

To access the URB 55, use the previously set network parameters. You also need to switch on the service.



# Configuring the conductivity controller

## Setting the MIN/MAX switchpoints and set point



Open the parameter screen.

LRR 1-52 conductivity controller (example)

### Description of parameters:



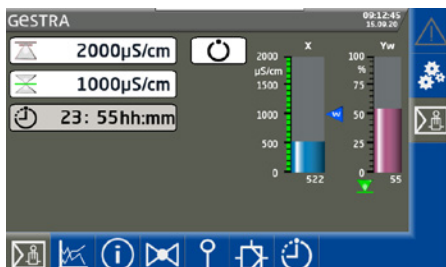
MAX alarm switchpoint



Set point



MIN alarm switchpoint



For each switchpoint, press the relevant button and enter the required value using the virtual keypad.



The icons in the buttons change color to indicate switchpoints/ alarm points that are too high or too low.

### Description of bar charts:

**X** Actual value

**W** Set point

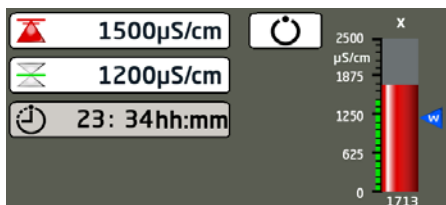


The set point is shown with a small arrow in the actual value bar chart.

**Yw** Manipulated variable

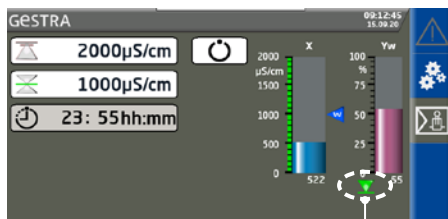
### Change of color on alarm

The bar chart column turns red in the event of an alarm.



## Configuring the conductivity controller

Icons and functions that vary depending on configuration:



### Valve controller



OPEN/CLOSED actuation of the valve is indicated by green valve icons in the manipulated variable bar chart.

### Automatic/manual mode



The controller is normally in automatic mode. Press the button to switch the controller to



manual mode.

### Entering the manipulated variable



Here you can enter the valve position or manipulated variable in the input field that opens.

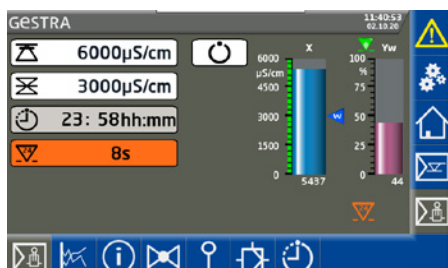
Display shows intermittent blowdown is active



### Display shows 24h flushing is active

After a restart, 24h flushing (if switched on) is active and is shown on the home screen. This is also the case for all further 24h flushing operations.

Display of remaining valve runtime (Ti) if 24h flushing is switched on



## Configuring the conductivity controller

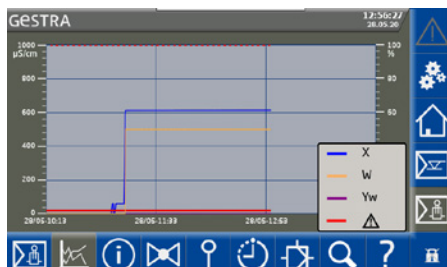
### Trend log



Open the trend log.

#### Description of display

The trend log shows the characteristic curve of the actual value (X), set point (W), manipulated variable (Yw) and alarm limits (⚠) over a 7-day period. The sampling rate is 5 seconds.



#### Options:



Open the associated key.



Open a menu bar with further functions:



#### Navigation:



Navigate forwards and backwards on the time axis using these buttons or by swiping horizontally



Zoom in/out using these buttons or two fingers (pinch gesture)



Close the window

## Configuring the conductivity controller

### Test - Testing the relays of the connected conductivity controller



Open the Info/Test menu to test the alarm and switching contacts of the connected controller.



Press the button to initiate the relay test.

This causes actual tripping of relay contacts in the controller.



The relevant icons are shown in the top part of the screen, depending on the configuration (example).

The relay in the controller remains active as long as you are pressing the button.



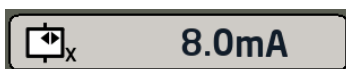
Actual value output 4 - 20 mA, display of current actual value (X) \*



or

Manipulated variable output 4 - 20 mA, display of current manipulated variable (Yw) \*

\* Controller software version 311178.13 or later



### View if configured as an intermittent blowdown controller

If the MIN relay is configured as an intermittent blowdown controller, the icons on the display change accordingly.





# Configuring the conductivity controller

## Setting the flushing interval and flushing time of the continuous blowdown valve

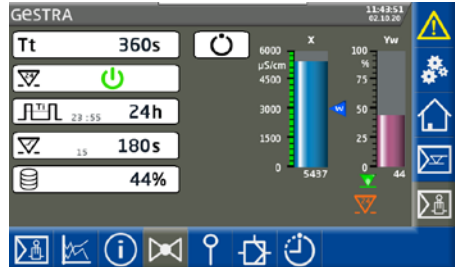


Open the “Valve” menu.

### Description of display/settings

**Tt** Valve runtime, see page 57

If the actual value/manipulated variable output is configured as a manipulated variable output (Yw), the valve runtime is no longer shown and therefore has no impact on control behavior. The manipulated variable therefore changes rapidly.

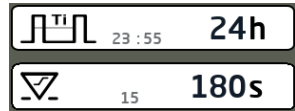


### Activate 24h flushing.



Press the button to activate 24h flushing.

Flushing interval



### Setting the flushing interval and flushing time

You can enter the desired times, within their limits, in the input fields.

When the set interval has elapsed, the flushing interval is activated and moves the valve to “Open” for the set time.

When the set flushing interval has elapsed, the valve returns to the “Closed” position for the set time.

The incrementing times are shown in the parameters.



Feedback of this action is shown on the home screen and in the bar charts, see page 57.



### Active parameters when a feedback potentiometer is connected to the conductivity controller.

The current valve position is shown in percent.

# Configuring the conductivity controller

## Calibrating the feedback potentiometer for a display of the continuous blowdown valve position



Even with a feedback potentiometer connected to the controller, the valve runtime still needs to be established and entered precisely.

Tt 360s

1. Tap the parameter display.

The current raw values then appear.

76%

### 100% (OPEN) / 0% (CLOSED)

Calibrated valve positions.

The calibrated raw data is shown in both fields.



#### Raw data

Indicates the current digital valve position.

100%	17441	
	13226	
0%	33	

## Performing calibration

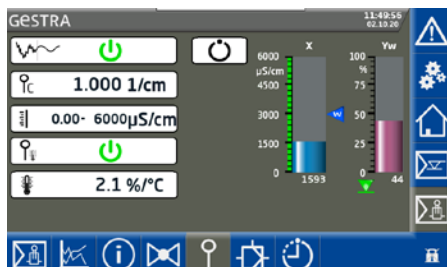
2. Press the Automatic button and switch to manual mode.
3. Enter “0%” as the manipulated variable (Yw).
4. When the valve is in the **(CLOSED) end position**, confirm this position.
5. The raw data from the central field is automatically entered in the 0% (CLOSED) field.
6. Next, enter “100%” as the manipulated variable (Yw).
7. When the valve is in the **(OPEN) end position**, confirm this position.
8. The raw data from the central field is automatically entered in the 100% (OPEN) field.

# Configuring the conductivity controller

## Calibrating the conductivity electrode



Open the menu.



LRR 1-52 (example)

### Brief description of parameters:



#### Damping \*

This parameter is used to settle the oscillations of the input signal.

\* Controller software version 311178.13 or later



#### Correction factor C, see page 59

During operation, the indicated conductivity may differ from the reference reading obtained from a reference measurement, e.g., due to dirt deposits.

When the correction factor is entered, the display is adapted to the current conductivity reading.



#### Measuring range (dependent on controller), see page 59

Enter the measuring range for your particular conductivity controller.

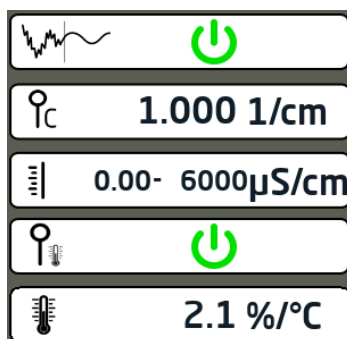


#### Temperature compensation On/Off



#### Set temperature coefficient

Proceed in the same way as when setting correction factor C.



## Configuring the conductivity controller

### Setting correction factor C

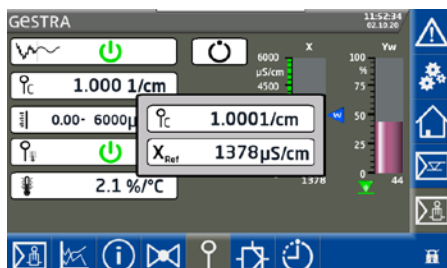
#### 1. Establish a **reference reading**.

Once service temperature is reached, measure the conductivity of a sample of water.

#### 2. Tap the **"Correction factor C"** input field.

#### 3. Either type in the correction factor **"C"** or

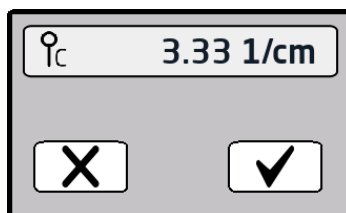
Enter the **reference reading** **"X<sub>Ref</sub>"** you previously measured.



#### Display after entering reference reading **"X<sub>Ref</sub>"**

☒ Confirm the calculated correction factor **"C"**.

☐ Reject the calculated correction factor **"C"**.



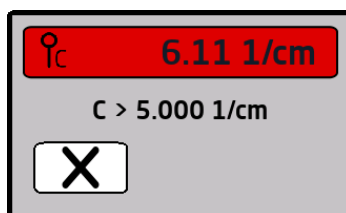
#### Display when limit is exceeded

If correction factor **"C"** exceeds the limit 5 1/cm, a warning appears.

In this case, you have no choice but to reject the calculated correction factor **"C"**.



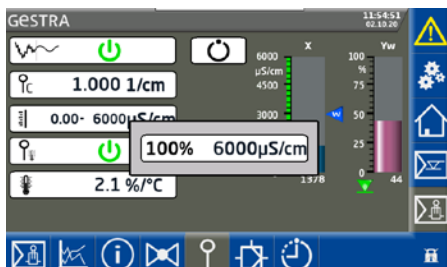
A value > 5 1/cm indicates heavy soiling of the conductivity electrode. The conductivity electrode must be cleaned.



## Configuring the conductivity controller

### Setting the measuring range of the LRR 1-52

Tap the input field and set the desired 100% measuring range.



### Setting the measuring range of the LRR 1-53

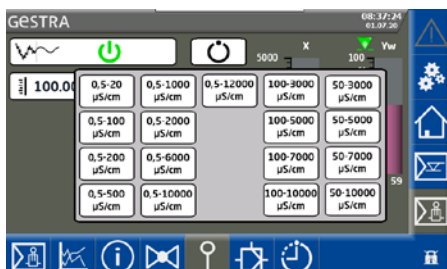
1. First bring the conductivity transmitter into service.



To do this, read the relevant Installation & Operating Manual.

2. Tap the input field.

You will see the screen containing the default measuring ranges.



3. Tap the measuring range that is set on the conductivity transmitter.

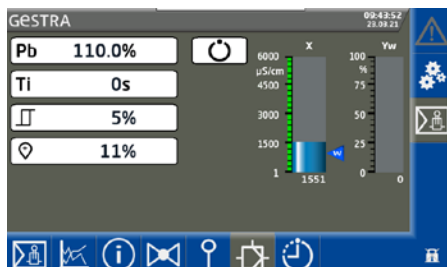
0,5-20 µS/cm	0,5-1000 µS/cm	0,5-12000 µS/cm	100-3000 µS/cm	50-3000 µS/cm
0,5-100 µS/cm	0,5-2000 µS/cm		100-5000 µS/cm	50-5000 µS/cm
0,5-200 µS/cm	0,5-6000 µS/cm		100-7000 µS/cm	50-7000 µS/cm
0,5-500 µS/cm	0,5-10000 µS/cm		100-10000 µS/cm	50-10000 µS/cm

# Configuring the conductivity controller

## Setting the control parameters



Open the control parameter screen.



## Guide to setting control parameters

Parameter		Control deviation	Control valve
Proportional band <b>Pb</b>	> larger	Large remaining deviation	Reacts slowly
	< smaller	Small remaining deviation	Reacts quickly and may open/close continually
	Example:	Measuring range 0 to 3000 ppm (0 to 6000 µS/cm) Set point SP = 1500 ppm (3000 µS/cm) Proportional band Pb = +/- 20% of set point = +/- 300 ppm (600 µS/cm) With the measuring range and set point mentioned above, the proportional band is then +/- 300 ppm (600 µS/cm) or in the range from 1200 ppm (2400 µS/cm) to 1800 ppm (3600 µS/cm).	
Reset time <b>Ti</b>	> larger	Slow correction of deviations	Reacts quickly
	< smaller	Fast correction of deviations, the control loop may tend to overshoot	Reacts slowly
Dead band 	> larger	Correction of deviations starts with a delay	In this range, the manipulated variable does not change.
	< smaller	Correction of deviations starts rapidly	Only reacts when the control deviation is larger than the "dead band".
Valve runtime <b>Tt</b>			Establish the real valve runtime, e.g., from "Closed" to "Open" (0 - 100%).
Operating position 			Defined opening of the continuous blowdown valve. Closes on standby.

Fig. 23

# Configuring the conductivity controller

## Setting automatic intermittent blowdown

If the function “MIN relay for intermittent blowdown” is set on the code switch of the conductivity controller (see page 63, **Fig. 19**), you can assign parameters using the Automatic Intermittent Blowdown button.

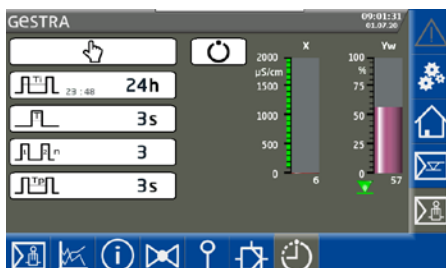


Open the menu.



### Auto / Manual

Switch between automatic intermittent blowdown and manual mode.



### Description of parameters:



#### Initiate intermittent blowdown manually

The display lights up amber when intermittent blowdown is active or has been initiated manually.



#### Intermittent blowdown interval (in hours)



#### Intermittent blowdown time (in seconds)

The intermittent blowdown valve is switched on regularly at set intervals and opens for the set intermittent blowdown time.



#### Intermittent blowdown pulses

Number of pulses



#### Pulse interval (in seconds)

Set the time between the individual intermittent blowdown pulses.



## System malfunctions of the URB 55

### Indication of system malfunctions in the alarm and error list using error codes

Error codes for the LRR 1-52/LRR 1-53 conductivity controllers		
Error code	Possible errors	Corrective action
<b>LRR Offline</b>	No power supply	Check data line (terminals 11 + 12)
<b>LRR NodeID</b>	Incorrect configuration	Set node ID (DIP 2) to ON, as there are two controllers
<b>A.001</b>	Above MAX switchpoint	-
<b>A.002</b>	Below MIN switchpoint	-
<b>E.001</b>	Below temperature sensor measuring range	Check Pt100 temperature sensor and replace if necessary Check electrical connection
<b>E.001</b>	Above temperature sensor measuring range	Check Pt100 temperature sensor and replace if necessary Check electrical connection <b>or</b> Switch off temperature compensation
<b>E.005</b>	Faulty conductivity electrode, measuring voltage < 0.5 V DC	Check conductivity electrode and replace if necessary Check electrical connection
	Faulty conductivity transmitter, measuring current < 4 mA	Check conductivity transmitter and replace if necessary Check electrical connection
<b>E.006</b>	Faulty conductivity electrode, measuring voltage > 7 V DC	Check conductivity electrode and replace if necessary Check electrical connection
	Faulty conductivity transmitter, measuring current > 20 mA	
<b>E.011</b>	Calibration points implausible/ wrong way round Valve: CLOSED (0%) > OPEN (100%)	Recalibrate potentiometer in continuous blowdown valve
<b>E.012</b>	Lower and upper ends of measuring range changed round	Reset the measuring range
<b>E.013</b>	Switchpoints implausible MIN > MAX	Reset the switchpoints

All error codes from E.001 to E.027 not listed here are available as reserves

**Fig. 24**



## System malfunctions of the URB 55

### Common faults and issues during use of the URB 55

USB stick cannot read/write files
<b>Remedy:</b>
<ul style="list-style-type: none"><li>■ Reboot the URB 55 with the USB stick inserted and perform the desired action again.</li><li>■ The USB stick must have the file format FAT32.</li><li>■ The USB stick may not be suitable for the data transfer.</li></ul>
The home screen remains blank
<b>Remedy:</b>
<ul style="list-style-type: none"><li>■ The URB 55 is not correctly connected to the data interface. The conductivity controller is not switched over when two units are connected.</li></ul>
Incorrect parameter display
<b>Remedy:</b>
Reboot the URB 55.

## System malfunctions of the LRR 1-52, LRR 1-53

### Causes

System malfunctions occur if components have been incorrectly installed or configured, if the equipment has overheated, if there is interference in the supply network or electronic components are faulty.

### Check the installation and configuration before systematic troubleshooting

#### Installation:

- Check that the installation location complies with the admissible ambient conditions in terms of temperature, vibration, interference sources, etc.

#### Wiring:

- Does the wiring conform to the wiring diagrams?
- Do the signal lines have the correct polarity?

#### Configuration on the conductivity controller:

- Are the inputs and functions correctly set on code switch **①**?

#### Electrode configuration:

- Are the electrodes correctly set and has the measuring range been calibrated?

### **DANGER**



#### **There is a risk of electric shock during work on electrical systems.**

- Always switch off the voltage to the equipment before working on the terminal strips (installation, electrical connection, removal).
- Disconnect all poles of the supply cable from the mains and secure so it cannot be switched back on.
- Check that the plant is not carrying live voltage before commencing work.

## What to do in the event of system malfunctions

### Check installation and function

When you have corrected system malfunctions, perform a function test as follows.

- Check installation and function
- Check settings



In the event of malfunctions or errors that cannot be corrected with the aid of this Installation & Operating Manual, please contact our service center or authorized agent.

## Taking the LRR 1-52, LRR 1-53 out of service

1. Switch off the supply voltage and switch off the voltage to the equipment.
2. Check that the equipment is not carrying voltage.
3. Unscrew and pull off the upper and lower terminal strips, see **Fig. 8 A ; B**
4. Release the slider holder on the base of the equipment and detach the conductivity controller from the support rail.

## Taking out of service URB 55

1. Switch off the supply voltage and secure so that it cannot be turned on again.
2. Unplug the mains connector from the equipment.
3. Unplug all plug and socket connections.
4. Unscrew the screws and remove the retaining clips.
5. Carefully push the unit out of the cutout in the door of the control cabinet.

## Disposal

Dispose of the conductivity controller in accordance with statutory waste disposal regulations.

## Returning decontaminated equipment

**If products have come into contact with media that are hazardous to health, they must be drained and decontaminated before being returned to GESTRA AG.**

The term 'media' can refer to solid, liquid or gaseous substances or mixtures, as well as radiation.

GESTRA AG can accept returned products only if accompanied by a completed and signed return note and also a completed and signed declaration of decontamination.



The return confirmation and declaration of decontamination must be attached to the outside of the return package, as processing will otherwise be impossible and the products will be returned to the sender at their expense.

**Please proceed as follows:**

1. Let GESTRA AG know about the return beforehand by e-mail or phone.
2. Wait until you have received the return confirmation from GESTRA.
3. Fill out the return confirmation (including declaration of decontamination) and send it with the products to GESTRA AG.

## UL components

LRR 1-52 and LRR 1-53 conductivity controllers are registered under XACN.E513189.

The URB 55 visual display and operating unit is registered under NRAQ.E199715.









You can find our authorized agents around the world at: **[www.gestra.com](http://www.gestra.com)**

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